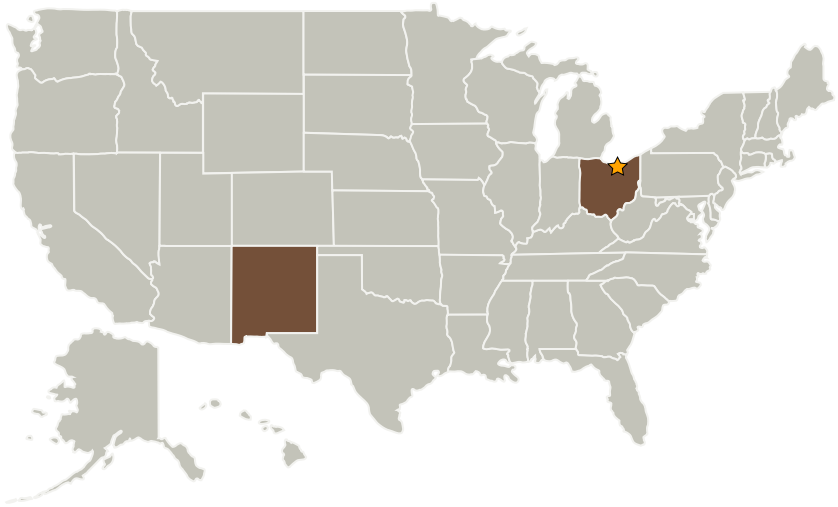
Advanced Fire Detector for Space Applications, Phase I

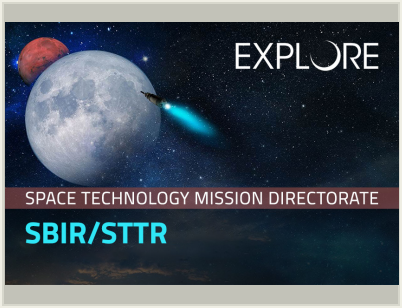
Completed Technology Project (2008 - 2008)

Project Introduction

Reliable and efficient fire detection is a precondition for safe spaceflight. The threat of onboard fire is constant and requires early, fast and unfailing detection. Current fire detectors are prone to fatigue and have insufficient sensitivity, selectivity and time-response. Smoke detectors cannot detect early stages of combustion and become unreliable if exposed to dust particulates. New sensor technology is required to face the challenging tasks associated with future space exploration involving missions to the Moon and Mars. Carbon monoxide formation is a reliable indicator of evolving fire threats onboard spacecraft and this gaseous combustion product allows rapid early detection. Vista Photonics proposes to evaluate and implement emerging infrared light sources for high-performance optical CO detection. Optical sensors are particularly favorable due to unique features like fast response, high precision and strong species selectivity. Design criteria such as small footprint, low weight, low power consumption as well as internal calibration and continuous sensor health monitoring will be implemented to provide a spaceflight optimized sensor. The proposed optical absorption approach uses modulation techniques together with a compact path length enhancing cell with a small sample volume.

Primary U.S. Work Locations and Key Partners





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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Glenn Research Center (GRC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Glenn Research Center(GRC)	Lead Organization	NASA Center	Cleveland, Ohio
Vista Photonics, Inc.	Supporting Organization	Industry	Santa Fe, New Mexico

Primary U.S. Work Locations	
New Mexico	Ohio

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Joerg Kutzner

Technology Areas

Primary:

- TX06 Human Health, Life Support, and Habitation Systems
  - TX06.4 Environmental Monitoring, Safety, and Emergency Response
    - TX06.4.2 Fire: Detection, Suppression, and Recovery